DETAILED ACTION

1. In view of the Appeal brief filed on 06/10/2009, PROSECUTION IS HEREBY REOPENED. New of ground of Rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624.

Response to Arguments

2. Appellant see page 3, argues Kano does not disclose " to correct the image to a state equivalent to its original state prior to the image processes, based on the image processing condition data attached thereto" and "a judgment means for judging whether the two images have been undergone image processes, based on the process confirmation data attached to each of the two images" to correct the image to a state

to its original state " is a transformation from (x,y) to (x^1, y^1) and (x^1, y^1) to (x,y). Examiner disagreed with appellant's argument because Kano discloses to correct the image to a state equivalent to its original state prior to the image processes, based on the image processing condition data attached thereto *(see fig.12, using a nonlinear warping in two different coordinates applied to (a) image on film and (b) objects or anatomical structures and page 461, col.2, the distorted grid pattern on image-1 in Fig.12(b) indicates the distortion of the object or anatomical structures, such that the pixel value at (x+Δx, y+Δy) on image-1 corresponds to the pixel value at (x,y) on image-2. The "warping" or "rewarping" of image-1 is now required to a transformation of the distorted grid pattern on the upper left to the square grid pattern on the upper right in Fig.12b*). and "judging whether the two images have been undergone image processes" means determination of a transformation process from (x,y) to (x^1, y^1) and (x^1, y^1) to (x,y). Examiner disagreed with appellant's argument because Kano discloses a judgment means for judging whether the two images have been undergone image processes, based on the process confirmation data attached to each of the two images (see fig.12b, and page 461, col.1-col.2*). Examiner suggested claim amendment to overcome Kano references Applicant's representative.* However applicant's representative does not accept it.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 22-25 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit[1], relying upon Supreme Court precedent[2], has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor are positively tied to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. *Machine test Analysis , in claim 22 in the steps " judging ", "correcting", "performing " and " the process confirmation" do not have any "computer " or " processor" or " device" to carry out all the steps of in claim 22. It is clear that claim 22 is not tied to a particular machine and claim does not fail to pass the machine test analysis. And also claim 22 does not have (a) physical or chemical transformation of a physical object, (b) no modification to data or signal; (c) claim 1 does not have either displaying or printing any where in claim ; (d) Modification and /or transformation not*

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[1] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

[2] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

meaningful or insignificant. Therefore claim 2 requires computers or processors or device after the word "comprising".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4-7, 10-13, 15-17, 19-22 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Kano (Akiko Kano, Kunio Doi, Heber MacMahon, Dayne D.Hasseell, and Maryellen L. Giger, Digital image subtraction of temporally sequential chest images for detection of interval change, Mediacla physics, Vol.21, No.3, March 1994).

Regarding claim 1, *Kano discloses* an image processing apparatus equipped with an inter image calculating means for performing inter image calculations to derive differences between two images of a single subject to obtain a difference image that represents the differences between the two images *(page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed no distorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained*

by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image),

wherein: process confirmation data representing whether an image has undergone image processes is attached to each of the two images *(see page 454, column 2, as applied preprocessing. With this technique, the "proper density distributions can be recovered from improperly exposed radiographs, and thus consistent density and contrast in temporally sequential chest images can be maintained. An exposure correction factor is estimated based on histogram analysis of a chest image),* and

image processing condition data representing image processing conditions are further attached to the images which have undergone image processes *(see page 454, column 2, as applied preprocessing. With this technique, the "proper density distributions can be recovered from improperly exposed radiographs, and thus consistent density and contrast in temporally sequential chest images can be maintained. An exposure correction factor is estimated based on histogram analysis of a chest image),* the image processing apparatus further comprising: a judgment means for judging whether the two images have undergone image processes, based on the process confirmation data attached to each of the two images ("judging whether the two images have been undergone image processes" means determination of a transformation process from (x, y) to (x^1, y^1) and see fig.12b, and page 461, col.1-col.2) and

a correction means for correcting an image which has been judged to have undergone image processes, to correct the image to a state equivalent to its original state prior to the image processes, based on the image processing condition data attached thereto *(see page 461, fig.12, using a nonlinear warping in two different coordinates system applied to (a) images on film and (b) objects or anatomical structure and col.1, the distorted in a different way as shown in Fig.12 (b). The distorted grid pattern on image-1 in Fig.12(b) indicates the distortion of the object or anatomical structures, such that the pixel value at (x+Δx, y+Δy) on image-1 corresponds to the pixel value of at (x,y) on image-2. The "warping" (or rewarding) of image-1 is now required for a transformation of the distorted grid pattern on the upper left to the square grid pattern on the upper right in Fig.12(b));*

wherein: the inter image calculation means performs the inter image calculation employing the corrected image, for the image which has been judged to have undergone image processes *(see page 456, column 1-column 2, a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).*

Regarding claim 4, *Kano discloses* an image processing apparatus as defined in claim 1, further comprising: a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match (*see page 458, column 2, subjective judgment of the matching/mismatching was based*

on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 459, column 2, It should be noted that misregistrations caused by large amount of difference in x-ray projections, such as severe AP inclination or rotation, could not be completely accommodated with the method. Developments to devices which can make patient positioning more reproducible are highly desirable in order to take advantage of the digital image subtraction technique).*

Regarding claim 5, *Kano discloses* an image processing apparatus as defined in claim 2, further comprising: a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match (*see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 459, column 2, It should be noted that misregistrations caused by large amount of difference in x-ray projections, such as severe AP inclination or rotation, could not be completely accommodated with the method. Developments to devices which can make patient positioning more reproducible are highly desirable in order to take advantage of the digital image subtraction technique).*

Regarding claim 6, *Kano discloses* an image processing apparatus as defined in claim 3, further comprising: a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match (*see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 459, column 2, It should be noted that misregistrations caused by large amount of difference in x-ray projections, such as severe AP inclination or rotation, could not be completely accommodated with the method. Developments to devices which can make patient positioning more reproducible are highly desirable in order to take advantage of the digital image subtraction technique).*

Regarding claim 7, *Kano discloses* an image processing apparatus equipped with an inter image calculating means for performing inter image calculations to derive differences between two images of a single subject to obtain a difference image that represents the differences between the two images *(see page 456, column 1-column 2, a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image),*

wherein: process confirmation data representing whether an image has undergone image processes is attached to each of the two images *(see page 454, column 2, a nonlinear density correction technique based on the H and D curve of the original radiographic films is applied a preprocessing);*

the image processing apparatus further comprising: a judgment means for judging whether the two images have undergone image processes, based on the process confirmation data attached to each of the two images *(see page 456, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows. Approximately, 70% (32) of all the cases examined showed "reasonably" good matchings, indicating no apparent mismatch for normal anatomic structures);* and

a correction means for correcting an image which has been judged to have undergone image processes, to cause the image to approximate its original state prior to the image processes, based on typical image processing conditions of image processes which have been administered to the image (*see page 454, column 2, a nonlinear density correction is performed in order to adjust the density and contrast in the two digitized images);*

wherein: the inter image calculation means performs the inter image calculation employing the corrected image, for the image which has been judged to have undergone image processes (*see page 456, column 1-column 2, a subtraction image is obtained by the difference between the wrapped current image and the previous image*

and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).

Regarding claim 10, *Kano discloses* an image processing apparatus as defined in claim 7, further comprising: a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 459, column 2, It should be noted that misregistrations caused by large amount of difference in x-ray projections, such as severe AP inclination or rotation, could not be completely accommodated with the method. Developments to devices which can make patient positioning more reproducible are highly desirable in order to take advantage of the digital image subtraction technique).*

Regarding claim 11, *Kano discloses* an image processing apparatus as defined in claim 8, further comprising:

a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 459, column 2, It should be noted that misregistrations caused by large amount of difference in x-ray projections, such as severe AP inclination or rotation, could not be completely accommodated with the method. Developments to devices which can make patient positioning more reproducible are highly desirable in order to take advantage of the digital image subtraction technique).*

Regarding claim 12, *Kano discloses* an image processing apparatus as defined in claim 9, further comprising:

a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 459, column 2, It should be noted that misregistrations caused by large amount of difference in x-ray projections, such as severe AP inclination or rotation, could not be completely accommodated with the method. Developments to devices which can make patient positioning more reproducible are highly desirable in order to take advantage of the digital image subtraction technique).*

Regarding claim 13, *Kano discloses* an image processing apparatus equipped with an inter image calculating means for performing inter image calculations to derive differences between two images of a single subject to obtain a difference image that represents the differences between the two images *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewrapping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image),*

wherein: process confirmation data representing whether an image has undergone image processes is attached to each of the two images *(see page 454, column 2, a nonlinear density correction technique based on the H and D curve of the original radiographic films is applied a preprocessing),* and

image processing condition data representing image processing conditions are further attached to the images which have undergone image processes *(see page 454, column 2, a nonlinear density correction technique based on the H and D curve of the original radiographic films is applied a preprocessing),* the image processing apparatus further comprising:

a judgment means for judging whether the two images have undergone image processes, based on the process confirmation data attached to each of the two images *(see page 456, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows. Approximately, 70% (32) of all the cases examined showed "reasonably" good matching, indicating no apparent mismatch for normal anatomic structures);* and

a correction means for correcting the difference image to be obtained by the inter image calculation in the case that at least one of the two images have undergone image processes, to obtain a difference image which would be obtained if the inter image calculation was performed employing the two images prior to the image processes, based on the image processing condition data attached thereto *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x,y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewrapping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).*

Regarding claim 15, *Kano discloses* an image processing apparatus as defined in claim 13, further comprising:

a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewrapping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).*

Regarding claim 16, *Kano discloses* an image processing apparatus as defined in claim 14, further comprising:

a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 454, column 1*

and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewrapping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).

Regarding claim 17, *Kano discloses* an image processing apparatus equipped with an inter image calculating means for performing inter image calculations to derive differences between two images of a single subject to obtain a difference image that represents the differences between the two images *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image),*

wherein: process confirmation data representing whether an image has undergone image processes is attached to each of the two images *(see page 454,*

column 2, a nonlinear density correction technique based on the H and D curve of the original radiographic films is applied a preprocessing), and

image processing condition data representing image processing conditions are further attached to the images which have undergone image processes *(see page 454, column 2, a nonlinear density correction technique based on the H and D curve of the original radiographic films is applied a preprocessing),* the image processing apparatus further comprising:

a judgment means for judging whether the two images have undergone image processes, based on the process confirmation data attached to each of the two images *(see page 456, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows. Approximately, 70% (32) of all the cases examined showed "reasonably" good matchings, indicating no apparent mismatch for normal anatomic structures);* and

a correction means for correcting the difference image to be obtained by the inter image calculation in the case that at least one of the two images are judged to have undergone image processes, to obtain a difference image approximating that which would be obtained if the inter image calculation was performed employing the two images prior to the image processes, based on typical image processing conditions of the image processes administered to the at least one of the two images *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x,y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The*

"warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).

Regarding claim 19, *Kano discloses* an image processing apparatus as defined in claim 17, further comprising: a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).*

Regarding claim 20, *Kano discloses* an image processing apparatus as defined in claim 18, further comprising:

a positional alignment means for aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows).*

wherein the inter image calculation means performs the inter image calculation between the two images which have been positionally aligned *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the*

previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).

Regarding claim 21, *Kano discloses* an image processing apparatus as defined in claim 1, wherein the process confirmation data and image processing conditions are attached to each of the two images as parameters written into a header portion of each of the two images *(see page 454, column 1-column 2, a matrix size 2000x2000 and a 10 bit gray scale. The digitized images were subsampled to a 500x500 matrix with an effective pixel size of O. 7x O. 7 mm2, because abnormalities in chest images which are*

subjected to our subtraction study are generally very large, as will be demonstrated later. First, a nonlinear density correction is performed in order to adjust the density and contrast in the two digitized image profiles).

Regarding claim 22, *Kano discloses* a method for deriving the differences between two images of a single subject to obtain a difference image that represents the differences between the two images (*see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x,y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image)*, the method comprising:

judging whether the two images have undergone image processing, based on process confirmation data attached to each of the two images *(see page 456, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows. Approximately, 70% (32) of all the cases examined showed "reasonably" good matching, indicating no apparent mismatch for normal anatomic structures);*

correcting an image which has been judged to have undergone image processing to correct the image to a state equivalent to its original state prior to the

image processing, based on image processing condition data attached thereto (see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at ($x+\Delta x$, $y+\Delta y$) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image); and

performing an inter image calculation employing the corrected image for the image which has been judged to have undergone image processing *(see page 456, column 2, subjective judgment of the matching/mismatch was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows. Approximately, 70% (32) of all the cases examined showed "reasonably" good matching, indicating no apparent mismatch for normal anatomic structures);* wherein the process confirmation data represents whether an image has undergone image processing, and is attached to each of the two images, and the image processing condition data represents image processing conditions, and are further attached to the images which have undergone image processing *(see page 454, column 2, a nonlinear density correction technique based on the H and D curve of the original radiographic films is applied a preprocessing).*

Regarding claim 25, *Kano discloses* a method for deriving the differences between two images as defined in claim 22, wherein the performing inter image calculation comprises:

aligning the positions of the two images so that structural components of the single subject substantially match *(see page 458, column 2, subjective judgment of the matching/mismatching was based on the obviousness of mismatch artifacts which tend to show a pair of black and white shadows);*

wherein the inter image calculation is performed between the two images which have been positionally aligned *(see page 454, column 1 and page 456, column 1-column 2, a previous chest image may be assumed nondistorted and is expressed by (x, y). Then the pixel value at (x+Δx, y+Δy) on the current image corresponds to the pixel value at (x, y) on the previous image. The "warping" (or rewarping) of the current image is required for subtraction with the previous image (details of coordinate transformation in appendix) and a subtraction image is obtained by the difference between the wrapped current image and the previous image and figure 5(a)-5(d) illustrate a pair of original chest images without significant interval change, the warped image and the resulting subtraction image).*

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2, 3, 8,9 14, 18, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano, as applied to claims 1, 7, 13, 17 and 22, above in view of Yanagita et al., "Yanagita" (U.S. Patent number 6, 415, 049 B1).

Kano discloses an image processing apparatus equipped with an inter image calculating means for performing inter image calculations to derive differences between two images of a single subject to obtain a difference image that represents the differences between the two images.

Kano does not disclose regarding claims 2, 8, 14, 18 and 23, an image processing apparatus and method as defined in claims 1,7, 13, 17 and 22, wherein: the image processes include a gradation process.

However, Yanagita discloses the image process include a gradation process *(see item 26, fig.4, figs., 12 and 14c, and column 3, lines 1-8 and Column 17, lines 44- 47).*

It would have been obvious to someone of the ordinary skill in the art the time when the invention was made to use Yanagita's gradation process in Kano's Image processing apparatus and method equipped with an inter image calculating means for performing inter image calculations to derive differences between two images of a single subject to obtain a difference image that represents the differences between the two images because it will allow to correct the lowered sharpness, *[Yanagita's, see column 1, lines 37-38].*

Kano discloses an image processing apparatus equipped with an inter image calculating means for performing inter image calculations to derive differences between

two images of a single subject to obtain a difference image that represents the differences between the two images.

Kano does not disclose regarding claims 3, 9 and 24, an image processing apparatus and method as defined as in claims 1,7 and 22, wherein: the image processes include a frequency process.

However, Yanagita discloses regarding claims 3, 9 and 24, an image processing apparatus and method as defined as in claims 1,7 and 22, wherein: the image processes include a frequency process *(see figs. and 14 and column 18, lines 16-20).*

It would have been obvious to someone of the ordinary skill in the art the time when the invention was made to use Yanagita's gradation process in Kano's Image processing apparatus and method because it will allow to correct the lowered sharpness, *[Yanagita's, see column 1, lines 37-38].*

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AKLILU k. WOLDEMARIAM whose telephone number is (571)270-3247. The examiner can normally be reached on Monday-Thursday 6:30 a.m-5:00 p.m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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